National Institute of Environmental Health Sciences

Socio-economic factors in the differential upsurge of tick-borne encephalitis in Central and Eastern Europe

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Abstract:

Tick-borne encephalitis (TBE), the most serious widespread vector-borne disease of humans in Europe, increased from 2- to 30-fold in many Central and Eastern European countries from 1992 to 1993, coinciding with independence from Soviet rule. Unemployment and low income have been shown in Latvia to be statistically associated with high-risk behaviour involving harvest of wild foods from tick-infested forests, and also with not being vaccinated against TBE. Archival data for 1970--2005 record major changes in the agricultural and industrial sectors, and consequent changes in the abiotic and biotic environment and socio-economic conditions, which could have increased the abundance of infected ticks and the contact of humans with those ticks. For example, abandoned agricultural fields became suitable for rodent transmission hosts; use of pesticides and emissions of atmospheric industrial pollutants plummeted; wildlife hosts for ticks increased; tick populations appear to have responded; unemployment and inequality increased in all countries. These factors, by acting synergistically but differentially between and within each country, can explain the marked spatio-temporal heterogeneities in TBE epidemiology better than can climate change alone, which is too uniform across wide areas. Different degrees of socio-economic upheaval caused by political transition in Estonia, Latvia, Lithuania, Slovenia and the Czech Republic can apparently explain the marked variation in TBE upsurge. Causal linkage between national socio-economic conditions and epidemiology is strongly indicated by striking correlations across eight countries between the degree of upsurge of TBE and both poverty and household expenditure on food (R2 Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.533 and 0.716, respectively).

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Security

Food/Water Security: Food Access/Distribution

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Czech Republic;Slovenia;Lithuania;Latvia;Estonia;Sweden;Poland;Slovakia;Hungary;Switzerland

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Tick-borne Disease

Tick-borne Disease: Tick-borne Encephalitis

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Low Socioeconomic Status, Workers

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content